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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Lutz Dorfmueller

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EXAMINER

VALONE, THOMAS F

ART UNIT

PAPER NUMBER

2831

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/582,546	Applicant(s) DORFMUELLER ET AL.	
	Examiner THOMAS F. VALONE	Art Unit 2831	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Supplemental Action replaces the previous Office Action (9/9/08) whose Detailed Action and IFW-Index of Claims is to be disregarded because of applicant's amendment to the claims. The rest of the accompanying forms (PTO-892, 1449, etc.) and documents of the previous Office Action are still of record. The period for the reply runs from the mailing of the Supplemental Action.

Claim Objections

2. Claim 14 is objected to because of the following informalities: Claim 14 depends from claim 12 which has the narrow limitation of a "interdigital comb structure". However, claim 14 broadens the limitation to "a structure" so that no clear understanding is possible. For examination purposes, it is assumed that any physical object meets the limitation. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 9-12, 14, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berger (WO 2004/097392) in view of Ishida (4,916,384) of record.

Regarding claims 9-11, 14, 17, Berger teaches a sensor for determining the concentration of particles in gases (Machine Translation, par. 2) having at least one substrate element and a measuring area between the first and second electrodes (14,

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par. 31 and Fig. 1) with a voltage applied between the electrodes (Fig. 6, 7 and AC signals, par. 39).

Berger does not explicitly teach an asymmetric electric field being formed on the measuring area where the electrodes are not parallel to each other and the distance between them increases or decreases along the length of the electrode.

Ishida, from the same field of endeavor, teaches an asymmetric electric field in the measuring area (13, col. 4, line 3-10), for measuring soot particles (col. 1, line 57) as in claim 17, where the electrodes are not parallel to each other and the distance between them increases or decreases along the length of the electrode (Fig. 4), as in claims 9-11. Ishida further teaches one measuring electrode (13, Fig. 4) with a structure along the side facing the other measuring electrode (12, Fig. 4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included an asymmetric electric field where the electrodes are not parallel to each other and the distance between them increases or decreases along the length of the electrode, with a structure along the side facing the other measuring electrode as taught by Ishida, in the Berger measuring area by modifying the electrode design, for the benefit of determining the volumetric concentration of soot particles in the measuring area considering conductivity and flow rate, as suggested by Ishida (col. 3, line 50-55 and line 65-67).

Regarding claim 12, Berger teaches the first and second electrodes forming an interdigital comb structure (Fig. 1) where at least one measuring electrode has finger electrodes with varying widths (par. 16). Berger further points out that the width or area

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variation of the two electrodes is maximally, one-tenth of the distance between the electrodes (par. 16).

5. Claims 13, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berger as modified by Ishida (B-I) as applied to claims 9-12, 14, 17 above, and further in view of Becker (5,858,192).

Regarding claim 13, 15, the teachings of B-I are reviewed above.

B-I does not teach measuring or finger electrodes with a triangular form or regularly arranged geometric shapes.

Becker, from the same field of endeavor, teaches measuring and a group of electrodes with a triangular form (col. 5, line 45-50 and col. 4, line 11), which is a geometric shape regularly arranged.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a measuring or finger electrodes with a triangular geometric form regularly arranged in the B-I sensor as taught by Becker, for the benefit of creating a spatially inhomogeneous electric field distribution, as suggested by Becker (col. 5, line 55-60).

6. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Berger as modified by Ishida (B-I) as applied to claims 9-12, 14, 17 above, and further in view of Bosch (6,634,210) of record.

Regarding claim 16, the teachings of B-I are reviewed above.

B-I does not teach a central electrode between the first and second measuring electrode.

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Bosch, from the same field of endeavor, teaches a central electrode (guard electrode, col. 7, line 60-65) between the first and second measuring electrode (18, 19, col. 9, line 20-25 and Fig. 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a central electrode in the B-I sensor between the first and second measuring electrode, as taught by Bosch, for the benefit of providing a separate ground connection, as suggested by Bosch (col. 7, line 25-30).

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS F. VALONE whose telephone number is (571)272-8896. The examiner can normally be reached on Tu-W-Th, 10:30-7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on 571-272-2245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thomas F Valone/
Patent Examiner, Art Unit 2831

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